



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/031,979	06/10/2002	Patrick S. Schnable	08411-013002	1138

7590 06/13/2005

Fish & Richardson
Suite 3300
60 South Sixth Street
Minneapolis, MN 55402

EXAMINER

MILLER, MARINA I

ART UNIT	PAPER NUMBER
----------	--------------

1631

DATE MAILED: 06/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/031,979	SCHNABLE ET AL.	
	Examiner	Art Unit	
	Marina Miller	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 32-50 and 55 is/are pending in the application.
- 4a) Of the above claim(s) 55 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 32-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>4/4/02; 8/12/02</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse Group III (claims 32-50) drawn to a method for producing a genetic map in the reply filed 3/14/2005 is acknowledged.

Claims 1-31, 51-54, and 56-95 are cancelled.

The examiner appreciates applicant's drawing attention to the preliminary amendments filed 1/25/2005. In view of the preliminary amendments, claim 55 is rejoined with elected claims 32-50.

An action on the merits of claims 32-50 and 55 follows.

Information Disclosure Statement

Information Disclosure Statements (IDS) filed 4/4/2002 and 8/12/2002 have been considered by the examiner. IDS filed 8/12/2002 lists reference by Neuffer et al ("AJ") that does not comprise page numbers and indicates that applicants submitted only "Table of contents." Examiner considered only pages submitted by applicant, *i.e.*, Table of contents. If applicant would like the entire publication to be considered and made of record, applicant must submit the entirety of the publication or those additional portions applicant wishes to make of record.

Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent

Claims 32, 41-45, and 48-50, and 55 are rejected under 35 U.S.C. 102(a) as being anticipated by Winzeler, *Science*, 281:1194-1197 (21 August, 1998).

Winzeler discloses a method for producing a genetic map of yeast (for genetic map see p. 1194, middle col., Fig. 3). Winzeler's method comprises a step of determining a pattern of hybridization products on an array for sets of samples contacting an array (multiple strains and segregates) (fig. 1), wherein each sample contains fractioned genomic nucleic acid (*see* reference 11, p. 1196) different for each strain and segregate (p. 1195, left col.) and a hybridization product is formed between the nucleic acids of the array and fractioned genomic nucleic acids (p. 1194 and fig. 1). The method also comprises a step of determining the relationships between nucleic acid sequences within the genome and the genetic relationship of different species, thereby forming a genetic map (see Fig. 1B and description on p. 1194). Winzeler also discloses contacting an array with a set of samples (fig. 1 and reference 11, p. 1196). Thus, Winzeler anticipates claims 32 and 50. Winzeler discloses plurality of sets of samples (two yeast strains and at least 10 segregates, p. 1195, left col.), thus anticipating claims 35 and 36. Winzeler discloses determining a pattern of hybridization products on an array for plurality of samples, wherein each sample is fractioned and hybridized to the array comprising a plurality of probes corresponding to a different sequence within the genome, the hybridization products are formed,

Art Unit: 1631

and the pattern of the hybridization indicates the genotype (*see* for general description of the method *see* p. 1194, middle and right col., and fig. 1; *see* for detecting a genotype of different species p. 1195, left col., and fig. 1B). Thus, Winzeler anticipates claim 55. Winzeler's fractionated genomic DNA is labeled (*see* reference 11, p. 1196) and hybridized with a set of unique array probes (fig. 1); thus Winzeler anticipates claims 41 and 42. Winzeler discloses at least 100, 500, and 1,000 array probes (*see* fig. 1 and p. 1194). Winzeler discloses determining the relative position of the nucleic acids within genome and relative distance between them (*see* fig. 1A, 2, and 3), thus anticipating claims 48-49.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 33-34 and 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Winzeler *Science*, 281:1194-1197 (21 August, 1998), as applied to claims 32, 41-45, and 48-50 above, in view of Biro, WO 98/30721, and further in view of Gardiner, Genetics, 134:917-930 (July, 1993).

Winzeler teaches the method of claims 32, 41-45, and 48-50, as set forth above.

Although Winzeler teaches digesting of genomic DNA with DNase I, she does not teach digesting with a restriction enzyme. Winzeler does not teach a plant species, specifically maize.

Art Unit: 1631

Biro discloses a method of fingerprinting genomic DNA (see claims 1-4) and specifically, maize (see p. 54). Biro teaches digesting genomic DNA with one, two or more different restriction enzymes (p. 26, line 17-24) before hybridization of the DNA with a probe array (p. 35, line 5-8). Biro does not specifically disclose digesting with five restriction enzymes.

Gardiner discloses the application of restriction fragment length polymorphism to genetic mapping in maize (see abstract). Gardiner teaches digesting genomic DNA before hybridization with multiple restriction enzymes, *e.g.*, *RcoRI*, *HindIII*, *EcoRV*, *BamHI*, *XbaI*, *DraI*, *XhoI*, and *BglII*, (p. 919)

It would have been obvious to one skilled in the art at the time of the invention to modify the method of Winzeler to use the restriction digestion of genomic DNA, such as taught by Biro and Gardiner, where the motivation would have been to control a complexity of a sample, as taught by Biro, p. 26. It would have also been obvious to one skilled in the art at the time of the invention to apply the method of Winzeler to plants, such as taught by Biro and Gardiner, where the motivation would have been to acquire knowledge of genetic variation for determining which gene contributes to a particular trait in plants, as taught by Winzeler, p. 1194.

Claims 46-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Winzeler *Science*, 281:1194-1197 (21 August, 1998), as applied to claims 32, 41-45, and 48-50 above, in view of Bowen U.S. Patent 6,541,684, and in view of Micheltore, PNAS, 88:9828-32 (1991).

Winzeler teaches the method of claims 32, 41-45, and 48-50, as set forth above.

Winzeler does not teach map distance between nucleic acids being 25 or 2 cM.

Bowen discloses a method for identifying markers linked to a particular genotype by hybridizing genomic DNA with specific probes (col. 14, line 22-27). Bowen discloses a method of genotyping a plant and, specifically maize (col. 13, line 29-67). Bowen discloses linked chromosomal sequences positioned within 25 and 2 cM (*see* Bowen, col. 13, line 47-67).

Michelmore discloses a method of identifying markers linked to disease-resistant genes by using a restriction fragment length polymorphism and a random amplification of polymorphic DNA (*see* Michelmore, abstract). Michelmore disclose linked chromosomal sequences positioned within 25 and 2 cM (Michelmore, p. 9830).

It would have been obvious to one skilled in the art at the time of the invention to modify the method of Winzeler to choose a positional marker within 2cM and 25 cM, such as taught by either Bowen or Michelmore, where the motivation would have been to reliably identify markers, as taught by Michelmore (p. 9828)

Claims 37-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Winzeler *Science*, 281:1194-1197 (21 August, 1998), as applied to claims 32, 41-45, and 48-50 above, in view of Dong, U.S. Patent 6,361,947.

Winzeler teaches the method of claims 32, 41-45, and 48-50, as set forth above.

Although Winzeler teaches digesting genomic DNA and applying the entire mixture to an array, she does not specifically teach multiple samples.

Dong discloses a method of complexity management of genomic DNA and using the DNA in hybridization experiments by applying the DNA to an array and detecting polymorphism (col. 1, line 47065). Dong discloses digesting genomic DNA with restriction

Art Unit: 1631

enzymes, separating fragments by size, and selecting DNA fragments of desired size (*i.e.*, creating multiple samples comprising fractioned genomic nucleic acids) (col. 6, line 26-35, and fig. 1-2).

It would have been obvious to one skilled in the art at the time of the invention to modify the method of Winzeler to use multiple samples, such as taught by Dong, where the motivation would have been to provide fast and cost effective exploration of complex samples of nucleic acids, as taught by Dong (col. 1, line 25-28).

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marina Miller whose telephone number is (571)272-6101. The examiner can normally be reached on 8-5, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ardin Marschel, Ph. D. can be reached on (571)272-0718. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1631

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Marina Miller
Examiner
Art Unit 1631

MM

MARJORIE A. MORAN
PRIMARY EXAMINER

Marjorie A. Moran
6/6/05